ACORNSOFT
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in software.

Micro-PROLOG
ISO-Pascal
Logo
LISP
BCPL
COMAL
FORTH

Acornsoft Languages

A CHOICE OF PROGRAMMING LANGUAGES
FOR THE BRITISH BROADCASTING CORPORATION
MICROCOMPUTER SYSTEM





ISO-Pascal is the natural language for large-scale programming, compiling to a compact intermediate code, which is then interpreted to give a performance superior to interpreted BASIC, without the complexities of machine code. The philosophy behind the design of Pascal was to provide a language in which the programmer's intentions are explicitly stated in the program. Thus all variables must be declared with their precise type, with array bounds stated, and the enumerated types allow the programmer to define the set of values that a variable can take. The result is faster debugging and comprehensive error-checking both at compile time and run time. These features also make it ideal for educational use at all levels.
Sample applications: writing business packages, compilers; learning programming.

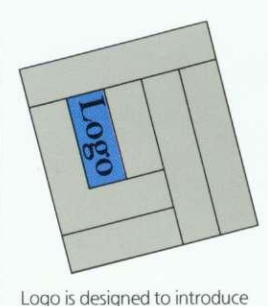


Acornsoft ISO-Pascal is a full implementation of Pascal to the BSI/ISO standard, with sound and graphics extensions. Two versions are available: in two language ROMs for the BBC Microcomputer models B, B+, or B+ 128K; and on Cartridge ROM for the Master 128. Each version is ISO-Standard Level 0, and comprises the compiler, intermediate code interpreter, and full screen editor. On the Master 128 the resident editor EDIT will be called from ISO-Pascal automatically.
With the language in ROM or Cartridge ROM programs may be edited, compiled, and run while retaining the source text in memory, and without requiring disc access. Program development is thus very rapid, making the system ideal for education. Where programs are too large to fit into memory they may alternatively be compiled to or from disc.
For speed-critical programming machine code can be incorporated into Pascal programs and called from Pascal routines.
The compilers feature comprehensive error checking which can be disabled for maximum speed of debugged programs, and can optionally generate full textual error messages when used with a disc system.
ISO-Pascal is supplied with a comprehensive user guide including a copy of the BSI ISO-Pascal specification, an introductory tutorial manual, a function key strip and a reference card of editor commands and error messages. Each version includes an extended version to ISO-Standard Level 1 supplied on disc to take full advantage of a Master Turbo, or a 6502 Second Processor if fitted. The disc also includes several demonstration programs.

Types Supported
char (1 byte)
character
boolean (1 byte)
true/false
integer (4 bytes)
−2E9 to 2E9
real (5 bytes)
−1.7E38 to 1.7E38, 9-digit accuracy
set (32 bytes)
sets of up to 256 elements
enumerated (1 byte)
up to 256 elements
pointer (2 bytes)
pointer to the heap
file (5 + element size)
for input/output
array
arrays/text
record
concatenation of components



Stand Alone Generator The ISO-Pascal Stand Alone Generator is a utility for use with the ISO-Pascal system which allows the distribution of finished Pascal programs to users who do not themselves have the ISO-Pascal system. Normally, the only way to run compiled Pascal programs is by use of the Pascal interpreter. The Stand Alone Generator constructs a file by adding only those sections of the interpreter that are required by the user's program, thus leaving as much memory as possible free for use by the program.
The Stand Alone Generator provides facilities for combining machine code routines with Pascal programs, and it produces code compatible with a 6502 Second Processor and with different filing systems (such as NFS or ADFS).
The pack consists of a disc, a user guide and a licence which allows up to 100 commercial copies of a program developed using the system to be distributed. An application form for a licence, which permits the distribution of unlimited copies for up to five years, is also included.



Logo is designed to introduce children and students to elementary programming techniques using a programmed 'screen turtle' to create graphics displays. It uses a set of simple commands centred on the turtle, rather than the more usual cartesian coordinate system, and this has since become widely known as 'turtle graphics'. In addition Logo includes many list-processing facilities, making it both a powerful introduction to programming and a problem-solving tool.
Sample applications: home and school education in graphics, mathematics, databases and problem solving at primary level and above.
Acornsoft Logo is a full implementation of Logo, containing all the standard turtle graphics and list-processing functions. It is available in two versions: on two language ROMs for the BBC Microcomputer Model B, B+, or 128K B+; and on a ROM Cartridge for the Master 128. Additional graphics features include changeable screen mode allowing multi-colour graphics, split and variable sized graphics and text windows, and a NIB feature which allows the turtle to make use of the BBC Microcomputer graphics system; for example, it allows the drawing of dotted lines or filled triangles under turtle control, and the SPRITE facilities of the Acornsoft Graphics Extension ROM. Multiple screen turtles can be 'hatched' and controlled independently using simple list-processing instructions, and providing a convenient link between Logo's graphics and list-processing facilities. A variety of floor turtles may also be driven.

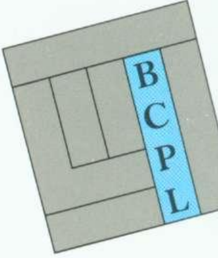


Acornsoft Logo includes a full implementation of all the list-processing and text-manipulation features of the language. It includes property lists, allowing the language to be used to build a simple filing system. Practical examples of list processing included with the demonstration programs are a story-writing program, computer conversation, a logic programming system, and a simple learning program.
Logo procedures may be interrupted with the Escape key, and the program examined or even altered before execution is resumed with the CONTINUE command, thus enabling programs to be debugged very simply.
Each pack includes an introductory manual, a comprehensive reference manual, a disc and cassette containing the floor turtle drivers and other utilities, a set of example programs and an accompanying explanatory booklet and a reference card.

Types Supported
Integer
−10E9 + 1 to 10E9 − 1
Floating point (5 bytes)
−1.7E38 to 1.7E38, 9-digit accuracy
Lists
eg. [THIS IS [A LIST]]
Words
eg. 'HELLO'

The Acornsoft Range Of Languages Provides A Wide Choice Of Different Approaches To Programming Problems And Applications, And Gives Access To Software Already Written In These Languages.
All Acornsoft Languages Are Developed Especially For Use With The BBC Microcomputer System Series Of Machines, And Include Convenient Extensions To Take Advantage Of The Graphics, Sound, And Other Special Features Of These Machines.
For Each Language There Is A Specially-written Comprehensive Reference Manual And, Where Appropriate, A Programming Introduction Both Of Which May Be Purchased Separately. In Many Cases The Packs Also Include Demonstration Example Programs, A Reference Card, Or A Function-key Strip.
All Languages Are Supplied On ROM, And Are Compatible With The BBC Microcomputer Model B, B+, 128K B+, And Master 128, And Offer Increased Execution Speed And Memory If Used With A 6502 Second Processor Or Master Turbo Co-Processor. In Addition, Special ROM Cartridge Versions Of ISO-Pascal, Logo, And LISP Are Available For Use With The Master 128. To Use The Other Language ROMs With The Master 128 They Should Be Inserted Into A Blank Cartridge Available Separately.





BCPL is one of the most flexible of modern structured languages and it is easy to learn. BCPL allows the programmer to implement arrays, records, and other datatypes by providing direct access to machine addresses, and operators for their manipulation. This gives BCPL the flexibiity of machine code making it especially suitable for low-level and system programming, but does place a greater onus on the programmer due to the limited error checking. It is particularly good at handling input and output, and hence is often used to write utility programs.
Sample applications: writing business packages, system software, compilers.
The Acornsoft BCPL package consists of a 16K ROM, 40/80 disc containing the compiler, a screen editor, a 6502 assembler, other utilities and program development aids, and some examples of BCPL code. A comprehensive 450 page user guide is also included in the package. The BCPL language can be used with any Acorn filing system, and it will automatically claim all available memory from a Master Turbo or a 6502 Second Processor if fitted.

THE ACORNSOFT RANGE OF LANGUAGES PROVIDES A WIDE CHOICE OF DIFFERENT APPROACHES TO PROGRAMMING PROBLEMS AND APPLICATIONS, AND GIVES ACCESS TO SOFTWARE ALREADY WRITTEN IN THESE LANGUAGES.

ALL ACORNSOFT LANGUAGES ARE DEVELOPED ESPECIALLY FOR USE WITH THE BBC MICROCOMPUTER SYSTEM SERIES OF MACHINES, AND INCLUDE CONVENIENT EXTENSIONS TO TAKE ADVANTAGE OF THE GRAPHICS, SOUND, AND OTHER SPECIAL FEATURES OF THESE MACHINES.

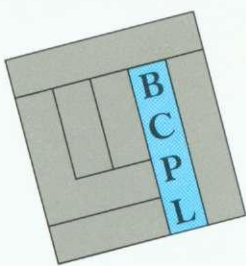
FOR EACH LANGUAGE THERE IS A SPECIALLY-WRITTEN COMPREHENSIVE REFERENCE MANUAL AND, WHERE APPROPRIATE, A PROGRAMMING INTRODUCTION BOTH OF WHICH MAY BE PURCHASED SEPARATELY. IN MANY CASES THE PACKS ALSO INCLUDE DEMONSTRATION EXAMPLE PROGRAMS, A REFERENCE CARD, OR A FUNCTION-KEY STRIP.

ALL LANGUAGES ARE SUPPLIED ON ROM, AND ARE COMPATIBLE WITH THE BBC MICROCOMPUTER MODEL B, B+, 128K B+, AND MASTER 128, AND OFFER INCREASED EXECUTION SPEED AND MEMORY IF USED WITH A 6502 SECOND PROCESSOR OR MASTER TURBO CO-PROCESSOR. IN ADDITION, SPECIAL ROM CARTRIDGE VERSIONS OF ISO-PASCAL, LOGO, AND LISP ARE AVAILABLE FOR USE WITH THE MASTER 128. TO USE THE OTHER LANGUAGE ROMS WITH THE MASTER 128 THEY SHOULD BE INSERTED INTO A BLANK CARTRIDGE AVAILABLE SEPARATELY.

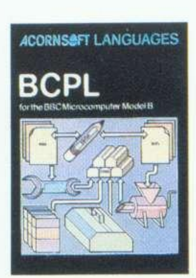


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Vords
eg. 'HELLO'



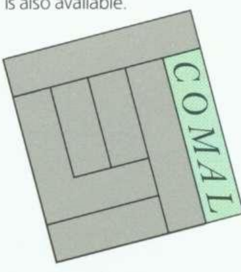
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Sample applications: writing business packages, system software, compilers.
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BCPL Calculations Package
BCPL is an untyped language, but routines can be added to provide floating-point and fixed-point arithmetic, and these are available in the BCPL Calculations Package.

Types Supported
integer (2 byte)
BCPL word
floating point (6 byte)
10E38 to 10E-38
fixed point (8 byte)
10E10 to 10E-4, 14-digit accuracy
fast integer (2 byte)
(BCPL word)/10000

BCPL Stand Alone Generator This package converts programs developed in BCPL into stand alone programs which can be run on any BBC Microcomputer, without the BCPL ROM fitted. Stand Alone programs can be produced either as files stored on any suitable medium or as language ROMs. This package consists of a disc of utility programs, a user guide and a licence permitting the distribution of up to 100 copies of a program developed using the system. A separate licence permitting unlimited distribution is also available.



The design of COMAL arose out of the desire for a block-structured language like Pascal for educational use, but interpreted like BASIC for the fastest possible development of programs. It includes a number of features which encourage well-structured programming and facilitate debugging and maintenance of software. The success of the design is such that it has been chosen as the educational standard in many European countries.
Sample applications: learning structured programming at secondary level and above.



Acornsoft COMAL adheres closely to the original specification of the language by B. Christensen, and supports reals, integers, booleans, and strings, as well as multi-dimensional arrays and extensive file handling facilities.

Types Supported
Integers (4 byte)
−2E9 to 2E9
Floating point (5 byte)
−1.7E38 to 1.7E38, 9-digit accuracy

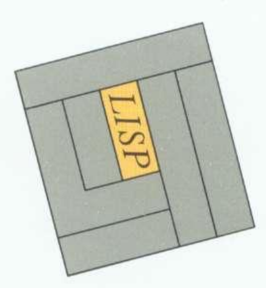


PROLOG is fundamentally different from other programming languages in the way that problems are expressed. Rather than being encoded as a sequence of steps to be followed to solve the problem, in PROLOG they are expressed as a set of facts about the problem, and rules which relate these facts to one another. This makes PROLOG especially suitable for solving problems in which the route to the solution is not clear.



A recent increase in interest in PROLOG followed the selection of PROLOG by the Japanese as the foundation for their Fifth Generation Computer Systems.
Sample applications: relational databases, expert systems, and problem solving; educational use in manipulating project data.
Acornsoft micro-PROLOG is compatible with versions of the language available on several other computers and in addition includes commands to take advantage of the BBC Microcomputer's sound and graphics facilities. The package consists of a language ROM, a comprehensive reference manual and a disc containing extension modules including the commonly used 'SIMPLE' and the more recently developed 'MITSI' modules. Also included is a version of the interpreter to take full advantage of a Master Turbo or a 6502 Second Processor if fitted.

Types Supported
Integers
−10E9 + 1 to 10E9 − 1
Floating point (5 byte)
−1.7E38 to 1.7E38, 9-digit accuracy
Lists
e.g. (a b c)

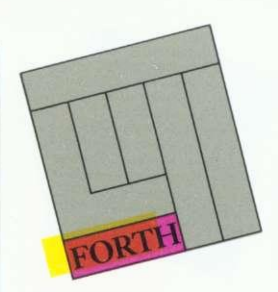


LISP is the fundamental list-processing language of artificial intelligence research, and the fact that it is still widely used more than twenty years after its original design is credit to the power of the language. Due to its simple overall structure LISP offers more flexibility in data and control structures than other languages, while giving fast enough execution for language design applications.
Sample applications: natural language manipulation, compiler design, experimentation with artificial intelligence problems.

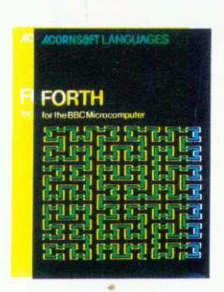


Acornsoft LISP is a fast interactive implementation of LISP containing a number of useful extensions to LISP including LOOP, WHILE and UNTIL control functions. It can be used in any graphics mode, and several extensions to the language are provided to take advantage of the BBC Microcomputer's graphics and sound facilities including VDU, CALL, MODE, TIME, INKEY and ADVAL. The system includes a LISP editor and a pretty-printer written in LISP so that they can be extended by the user.
It is available either as a language ROM for the BBC Microcomputer Models B, B+, and 128K B+, or on ROM Cartridge for the Master 128. Each version will automatically relocate itself to give additional memory on a Master Turbo, or if a 6502 Second Processor is fitted. A comprehensive guide to Acornsoft LISP, 'LISP on the BBC Microcomputer', is supplied with the ROM Cartridge version, or is available separately for use with the other versions. As well as an introduction to programming in LISP, it includes a complete glossary of all predefined functions, and several example programs illustrating typical applications of the language.

Types Supported
integer (16 bit)
−32768 to 32767
strings
up to 127 characters
lists
eg. (A B (C D) (E))



FORTH began life in a public domain version, which contributed to its popularity as one of the first languages available on microcomputers. It is a compiled language using a concise stack-oriented syntax, and programs run very fast (typically five times faster than BASIC). One of the key features of FORTH is the ability to define new keywords, allowing the user to create new FORTH-based languages. *Sample applications: machine control, games development.* Acornsoft FORTH adheres to the 1979 Standard. It is supplied on a language ROM which permits the use of any graphics mode, and includes a resident FORTH screen editor, macro assembler, textual error messages, and several additional words to control the BBC Microcomputer's sound and graphics facilities. A slightly restricted version of Acornsoft FORTH is also available on disc or cassette.



A general introduction to Acornsoft FORTH, 'FORTH on the BBC Microcomputer', is available separately and is recommended for use with the language. It includes a full description of Acornsoft FORTH accompanied by many practical examples, and a glossary defining the actions of all the standard words.

Types Supported
Integer (16 bit)
−32768 to 32767 or
0 to 65535

To purchase any of these titles either contact your local dealer or complete and send this order form to Acorn Computers Limited, Acornsoft, Unit 5, Cambridge Technopark, 645 Newmarket Road, Cambridge CB5 8PD.

ISO-Pascal
Sample Program

```
program days of week (input,
output);
type days = (monday,
tuesday, wednesday, thursday,
friday, saturday, sunday);
var today: days;
begin
for today: = monday to
sunday do
if today in [monday..friday]
then writeln ('get up – its
work today')
else writeln ('Ah! a lie
in.........')
end.
```

BCPL
Sample Program – Print Octal Number

```
LET WRITEOCT (N,D) BE
$( IF D > 1 DO WRITEOCT
(N>>3,D-1)
WRCH((N & 7) + 'O') $)
```

Logo
Sample Program – 4 Turtles Linked Together

```
TO CROSS
DRAW
HATCH [1 2 3]
START 0 START 1 START 2
START 3
TELL [0 1 2 3]
END

TO START: NUMBER
TELL: NUMBER
RIGHT: NUMBER *90
SHOWTURTLE
END
```

COMAL
Sample Program – Read and display text

```
10 WHILE NOT EOD
20 READ text$
30 PRIINT text$
40 END WHILE
50 PRINT "that's all."
60 END
70 DATA Some, text, to, read
```

Micro-PROLOG
Sample Program – Drug-use Expert System

```
add (x recommended for y if y
complains of z and x
suppresses z and not x may
harm y)
add (x may harm y if x
aggravates z and y suffers
from z)
add (aspirin suppresses
headache)
add (valium suppresses
anxiety)
add (aspirin aggravates peptic
ulcer)
add (Alice complains of
headache)
add (Alice suffers from
ingrowing toenails)

is (valium recommended for
Alice)
NO

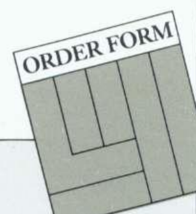
which (x: x recommended for
Alice)
aspirin
No (more) answers
```

LISP
Sample Program – Finds a Value in a List

```
(DEFUN FIND (LIST VALUE)
(COND
((NULL LIST) NIL)
((EQ VALUE (CAR LIST)) LIST)
(T (FIND (CDR LIST) VALUE))))
```

FORTH
Sample Program – Factorial Function

```
: FACT 1 SWAP ?DUP IF 1+ 1
DO I * LOOP THEN ;
```



disc / ROM / ROM Cartridge		Stock Code	Price inc VAT £	Qty	Total
ISO-Pascal for the Master 128 (including manuals)	ROM Cartridge	SQL18	69.00		
ISO-Pascal for the Models B, B+ and 128K B+ (including manuals)	ROM	SBL18	69.00		
ISO-Pascal Reference Manual		SBD18	10.00		
ISO-Pascal Stand Alone Generator	disc	SNL24	34.95		
Logo for the Master 128 (including manuals)	ROM Cartridge	SQL06	69.00		
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Introduction to Logo		SBD20	3.50		
Logo Reference Manual		SBD21	7.50		
BCPL (including User Guide)	ROM	SNL03	59.80		
BCPL User Guide		SBD10	15.00		
BCPL Calculations Package	disc	SNL10	34.50		
BCPL Stand Alone Generator	disc	SNL12	49.90		
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Introduction to COMAL		SBD19	10.00		
Micro-PROLOG (including manual)	ROM	SBL17	79.95		
Micro-PROLOG Reference Manual		SBD32	10.00		
LISP for the Master 128* (including manual)	ROM Cartridge	SQL14	59.80		
LISP for the Models B, B+, and 128K B+	ROM	SBL14	49.85		
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FORTH Manual		SBD03	7.50		
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